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Description of a new **PSEUDOMORPHA** from California, with notes on the
Pseudomorphidæ.

BY GEO. H. HORN, M. D.

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The species described in the present paper was found by myself in Owen's Valley, California, on the flowers of the Lupin (*Astragalus*). It was subsequently collected by Dr. Cronkhite, Ass't. Surg. U. S. A., in the same region, and this, with other interesting species, sent me for examination. These insects are not easy to obtain, as they are provokingly agile. The same fact has been noticed in our eastern species by Dr. Zimmerman, of Columbia, S. C., who has occasionally seen a few specimens without being able to catch them.

PSEUDOMORPHA, Kirby.

P. Cronkhitei, elongato-ovalis, modice depressa, brunneo-castanea, nitida, vix punctata, thorace latitudine duplo longiore, lateribus rotundatis, marginatis et margine parce fimbriolata, angulis posticis obtusis, elytris subparallelis, margine parce fimbriata; subtus ferruginea. Long. 35.

This species may be readily known by its smoothness, being almost entirely free from punctures, except near the lateral margin of the thorax, where but few exist. The thorax is scarcely broader than the elytra, slightly emarginate in front, truncate behind, sides ciliate with short hairs, margin broader anteriorly. Elytra impunctured, subparallel, slightly ciliate. Beneath ferruginous. The third, fourth and fifth abdominal segments have each a transverse pilose spot near the middle, which may indicate sexual differences. The specimens in my collection, three in number, are all alike and exhibit among themselves no differences of a sexual nature.

I dedicate the species with great pleasure to Dr. Cronkhite, whose liberality has aided me greatly in the study of the Coleoptera of California and Oregon. The discovery of a species of this genus in California is remarkable and adds another fact to the already inexplicable law of distribution of genera in Australia, South America and California.

There is no group among the Carabidæ, as at present recognized, presenting so many anomalies as that to which this insect belongs;

consequently diverse opinions have been expressed regarding its systematic position. The most striking peculiarity at first sight is their form. They resemble anything else but Geodephagous Adephaga, while on the contrary, without an examination of the legs, any of the species of *Sphallomorpha* or *Silphomorpha* would be considered aquatic entomophaga related to *Gyrinus*. This similarity has been adverted to by Westwood (*Trans. Linn. Soc.* xviii, p. 409), in an interesting paper on relations between various families and orders of insects, in which several new genera and species were described, and those of a form still more removed from the type of Carabidæ than *Pseudomorpha*. *Adelotopus* is, however, the most abnormal, not only in form but also in structure as seen notably in the antennæ. The idea that these insects should constitute a family apart of equal value with Carabidæ, Dytiscidæ and Gyrinidæ, has been put forward by Mr. E. Newman, (*Entomologist*, p. 365, et seq.) without stating any special characters, mentioning only that, as *Pseudomorpha* is the first genus described, its characters should be those of the proposed family. Westwood, Lacordaire and others dissent from the opinion of Newman, and prefer to retain the Pseudomorphidæ among the Carabidæ as a tribe, though equally out of place wherever it may be interpolated.

Certain peculiarities in these insects have been pointed out by Dr. LeConte (*Class. Coleop. N. A.* p. 15), which appear to have been overlooked by the European writers such as the form and position of the eyes and the form of the posterior coxæ. The eyes are more or less irregular in outline, either truncate on one side or angulated. They are really confined to the upper side of the head; for the margin of the head appears to dip down under the eye and form a floor to the eye. The margin of this plate is at times thickened, as in *Adelotopus*, and appears to be a canthus dividing the eyes into two, as in *Gyrinus*. The error of considering the eyes double is still further aided by the smoothness of this portion of the head under the eyes. Lacordaire allowed himself to fall into the error of describing the eyes of *Adelotopus* as being divided into two by a slender canthus.

The posterior coxæ show considerable divergence from the true Carabideous type, being contiguous on the median line and of a form more nearly resembling the Dytiscidæ. The articular lobe is narrow, and the points with which the thighs are articulated are at the tips of these lobes, and more nearly approximated than in the Carabidæ. In the Carabidæ the articular lobe is broader, and permits the femoral articulation rather externally than at the tips.

The very narrow separation of the middle coxæ, and the connate mentum and gula, are characters not without some value in the isolation of the Pseudomorphidæ as a separate family. The narrow separation of the middle coxæ is not however a constant character in this family. In the species just described these coxæ are as widely separated as in many species of *Platynus*.

The form of the antennæ of *Adelotopus*, and the number of abdominal segments in *Hydroporomorpha*, though very anomalous characters, cannot assist materially in the establishment of the family, each character being found singly in the genera named. The principal character, therefore, will be found in the contiguity of the posterior coxæ, and the consequent separation of the metasternum from the abdominal segments.

The relationships of the Pseudomorphidæ with the Carabidæ and Dytiscidæ may be thus tabulated :—

Legs cursorial.

Metasternum attaining the abdomen; hind coxæ separated.

Antennæ inserted on the front.....**Cicindelidæ.**

Antennæ inserted under the margin of the front.....**Carabidæ.**

Metasternum not attaining the abdomen; hind coxæ contiguous.

Metasternal parapleuræ attaining the abdomen.....**Pseudomorphidæ.**

Metasternal parapleuræ not attaining the abdomen...**Amphizoidæ.**

Legs natatorial.

Eyes two; antennæ filiform.....**Dytiscidæ.**

Eyes four; antennæ irregular.....**Gyrinidæ.**

From the above table it will be seen that the Pseudomorphidæ form a link from the Carabidæ through Amphizoidæ to the Dytiscidæ, with undoubted tendencies toward the Gyrinidæ, and by their removal from the Carabidæ tend to render that great family more homogeneous.

The Pseudomorphidæ are contained at present in five genera, and may be arranged as follows :—

Head horizontal; mouth anterior; antennæ filiform.

Without antennal grooves.....**Pseudomorpha.**

With antennal grooves.

Mentum entire; ventral segments four.....**Hydroporomorpha.**

Mentum emarginate; ventral segments six.

Posterior angles of prothorax distinct.....**Sphallomorpha.**

Posterior angles of prothorax rounded.....**Silphomorpha.**

Head deflexed, front very convex; mouth inferior; antennæ

clavate.....**Adelotopus.**

In the monographic notice of these insects, (*Rev. et Mag. Zool.* 1853, p. 395), Westwood unites the first, third and fourth genera, without as-

signing any reason, at the same time describing new species which should not be included in *Pseudomorpha*. The two genera, *Silphomorpha* and *Sphallomorpha*, can hardly be considered as distinct, the characters separating them being hardly of more value than as a means of defining generic groups. The whole subject has yet need of a revision, and it is to be hoped that those entomologists who have a full series of species accessible will determine their synonymy, and relieve them from the partial confusion in which they are at present found.

The habits of these insects are remarkable. Both our North American species live on flowers, and are very agile, while that from South America and those of Australia appear to live under bark.

For an opportunity of examining a small series of these insects, I am indebted to Dr. Leconte, to whom all the species in the Cambridge Museum were sent by Prof. Agassiz for study and identification.

On AMPHIZOA INSOLENS, Leconte.

BY GEO. H. HORN, M. D.

It is not expected that anything new will be written in the present paper, as the insect has been fully described by Dr. Leconte, (*Proc. Acad.* vi, p. 227,) and its systematic position ably discussed, while Dr. Schaum (*Insecten Deutschlands*) reviews the work and expresses a different opinion regarding its relationships. As it is very desirable to have all difficulties removed and differences of opinion adjusted, it has been thought advisable to present the subject anew to systematists, in order that the end may be reached. With this view, wood-cuts, carefully drawn, have been prepared, to illustrate the various external parts.

As the habits of this insect have been fully exposed (*Proc. Ent. Soc. Phil.*, Vol. vi, p. 289), it will be unnecessary to reiterate in the present paper, except to state that they live as do the Parnidæ, adhering to stones under running water. They are entirely sub-aquatic, and have never been found on land. It was my good fortune to capture a fine series of this insect while traveling in north-eastern California, among the streams tributary to Pit River, itself the larger fork of the Sacramento. Though still a rare insect in collections, it has been